

What is claimed is:

- 1 1. An apparatus comprising:
2 a differential preamplifier stage having a differential output; and
3 a distributed differential amplifier stage having a differential end
4 termination interface coupled to the differential output.
- 1 2. The apparatus of claim 1, further including feedback to manipulate a
2 signal to be provided to the distributed differential amplifier stage.
- 1 3. The apparatus of claim 1, further including a bridging element coupled
2 between a differential input of the distributed differential amplifier stage and a
3 differential output of the distributed differential amplifier stage.
- 1 4. The apparatus of claim 3, wherein the bridging element comprises a
2 microstrip transmission line segment.
- 1 5. The apparatus of claim 1, wherein the distributed differential amplifier
2 stage comprises a first output transmission line and a second output transmission line
3 differentially coupled to the first output transmission line.
- 1 6. The apparatus of claim 5, wherein the first output transmission line and
2 the second output transmission line are coupled by at least one passive element.
- 1 7. The apparatus of claim 1, wherein the differential end termination
2 interface comprises at least one passive element coupled between a first line and a second
3 line of the differential output.

1 8. An apparatus comprising:
2 a differential preamplifier stage coupled to a distributed differential
3 amplifier stage, wherein the distributed differential amplifier stage has a first output
4 transmission line differentially coupled to a second output transmission line.

1 9. The apparatus of claim 8, wherein the distributed differential amplifier
2 stage has a differential end termination interface.

1 10. The apparatus of claim 9, wherein the differential end termination
2 interface couples a differential output of the lumped differential preamplifier stage.

1 11. An apparatus comprising:
2 a differential traveling wave amplifier having a differential input and a differential
3 output; and
4 at least one bridging element coupled between the differential input and the
5 differential output.

1 12. The apparatus of claim 11, further comprising a first transistor coupled to
2 a first line of the differential input and a second transistor coupled to a first line of the
3 differential output.

1 13. The apparatus of claim 12, wherein the at least one bridging element is
2 coupled between the first transistor and the second transistor.

1 14. The apparatus of claim 11, further comprising a current source coupled
2 between first and second lines of the differential output.

1 15. The apparatus of claim 11, further comprising at least one damping
2 element coupled to the at least one bridging element.

1 16. A system comprising:
2 a differential preamplifier stage having a differential output;
3 a distributed differential amplifier stage having a differential end
4 termination interface coupled to the differential output; and
5 an optical fiber coupled to the distributed differential amplifier stage.

1 17. The system of claim 16, further including an optical modulator to
2 modulate a signal received from the distributed differential amplifier stage.

1 18. The system of claim 16, further comprising feedback to manipulate a
2 signal to be provided to the distributed differential amplifier stage.

1 19. The system of claim 16, further including a bridging element coupled
2 between an input and an output of the distributed differential amplifier stage.

1 20. The system of claim 19, wherein the bridging element comprises a
2 transverse electromagnetic transmission line segment.

1 21. The system of claim 16, wherein the distributed differential amplifier
2 stage further includes a first output transmission line differentially coupled to a second
3 output transmission line.

1 22. The system of claim 21, further comprising an output differential end
2 termination interface coupled to the first and second output transmission lines.

1 23. A method comprising:
2 terminating a differential output of a differential preamplifier stage via a
3 differential end termination interface of a distributed differential amplifier stage.

1 24. The method of claim 23, further including modulating an output signal of
2 the distributed differential amplifier stage.

1 25. The method of claim 23, further including limiting an amplitude of the
2 differential output.

1 26. The method of claim 23, further including feeding back the differential
2 output to manipulate the differential output.

1 27. The method of claim 23, further including bridging an input line and an
2 output line of the distributed differential amplifier stage with a transverse electromagnetic
3 transmission line segment.

1 28. An apparatus comprising:
2 a preamplifier stage having a preamplifier output;

3 a differential traveling wave amplifier coupled to receive the preamplifier output;
4 and
5 at least one feedback control element coupled between the preamplifier stage and
6 the differential traveling wave amplifier to adjust a swing of the preamplifier output.

1 29. The apparatus of claim 28, wherein the at least one feedback element is
2 coupled to adjust an alternating current swing and a direct current voltage level of the
3 preamplifier output.

1 30. The apparatus of claim 28, further comprising a differential end
2 termination interface coupled to the preamplifier output.